

CLAIMS

What is claimed is:

1. A method for altering a Standard Commands for Programmable Instrumentation (SCPI) command set for instrument control, comprising:
 - selecting a node to alter, wherein each command of the command set comprises a different combination of SCPI grammatical elements, wherein the SCPI grammatical elements are organized hierarchically in a tree data structure, and wherein the tree has nodes with each node comprising one of the SCPI grammatical elements;
 - specifying an alteration to the selected node;
 - restricting access to the selected node and to any descendant nodes of the selected node;
 - altering the selected node in accordance with the specified alteration, wherein the step altering the selected node is performed at runtime; and
 - removing access restriction to the selected node and to any descendant nodes of the selected node, wherein at least the restriction, alteration, and removal steps are performed while the instrument is operational.
2. The method as recited in claim 1, wherein the step altering the selected node comprises:
 - when the grammatical element of the selected node is to be removed

- from the command set,
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- removing the selected node and any descendant nodes of the
- 8 selected node from the tree;
- 10 otherwise, when a new node comprising a new grammatical element is
- 12 to be added to the command set
- preparing the new node including the new grammatical element
- 14 for inclusion in the tree and
- 16 adding the new node to the tree; and
- 18 otherwise,
- 20 appropriately changing the grammatical element of the selected
- node.
3. The method as recited in claim 2, wherein at least one node other than
- 2 the selected node is accessible for instrument control while at least the
- restriction, alteration, and removal steps are performed.
4. The method as recited in claim 2, wherein the selected node is the
- 2 tree's root node.
5. The method as recited in claim 1, wherein alteration of the command
- 2 set is automatically enabled by possession of an electronic license for
- change in instrument capability as specified by the license.
6. A computer readable memory device embodying a computer program

- 2 of instructions executable by the computer for altering a Standard
Commands for Programmable Instrumentation (SCPI) command set
4 for instrument control, the instructions comprising:
- 6 selecting a node to alter, wherein each command of the command set
comprises a different combination of SCPI grammatical elements,
8 wherein the SCPI grammatical elements are organized hierarchically in
a tree data structure, and wherein the tree has nodes with each node
10 comprising one of the SCPI grammatical elements;
- 12 specifying an alteration to the selected node;
- 14 restricting access to the selected node and to any descendant nodes of
the selected node;
- 16
- 18 altering the selected node in accordance with the specified alteration,
wherein the step altering the selected node is performed at runtime; and
- 20 removing access restriction to the selected node and to any descendant
nodes of the selected node, wherein at least the restriction, alteration,
22 and removal steps are performed while the instrument is operational.
7. The computer readable memory device as recited in claim 6, the
- 2 instruction altering the selected node comprising:
- 4 when the grammatical element of the selected node is to be removed
from the command set,
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- 8 removing the selected node and any descendant nodes of the
selected node from the tree;

10 otherwise, when a new node comprising a new grammatical element is
to be added to the command set

12 preparing the new node including the new grammatical element
for inclusion in the tree and

14 adding the new node to the tree; and

16 otherwise,

18 appropriately changing the grammatical element of the selected
20 node.

2 8. The computer readable memory device as recited in claim 7, wherein at
least one node other than the selected node is accessible for instrument
control while at least the restriction, alteration, and removal steps are
4 performed.

2 9. The computer readable memory device as recited in claim 7, wherein
the selected node is the tree's root node.

2 10. The computer readable memory device as recited in claim 6, wherein
alteration of the command set is automatically enabled by possession
of an electronic license for change in instrument capability as specified
4 by the license.

2 11. A system for altering a Standard Commands for Programmable
Instrumentation (SCPI) command set for instrument control,
4 comprising:

6 a grammar logic module, wherein each command of the command set
comprises a different combination of SCPI grammatical elements,
8 wherein the SCPI grammatical elements are organized hierarchically in
a tree data structure, wherein the tree has nodes with each node
10 comprising one of the SCPI grammatical elements, wherein when a
node is selected for alteration and an alteration to the selected node is
12 specified, the grammar logic module has capability of restricting access
to the selected node and to any descendant nodes of the selected node,
14 altering the selected node in accordance with the specified alteration,
wherein the step altering the selected node is performed at runtime, and
removing access restriction to the selected node and to any descendant
16 nodes of the selected node, and wherein while access to the selected
node is restricted, the instrument is operational.

12. The system as recited in claim 11,

2 wherein when the grammatical element of the selected node is to be
4 removed from the command set,

6 the grammar logic module has capability of removing the
selected node and any descendant nodes of the selected node
8 from the tree;

10 otherwise, when a new node comprising a new grammatical element is
to be added to the command set

12 the grammar logic module has capability of preparing the new
14 node including the new grammatical element for inclusion in
the tree and

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adding the new node to the tree; and

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otherwise,

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the grammar logic module has capability of appropriately
changing the grammatical element of the selected node.

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13. The system as recited in claim 12, wherein at least one node other than
the selected node is accessible for instrument control while access to
the selected node is restricted

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14. The system as recited in claim 12, wherein the selected node is the
tree's root node.

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15. The system as recited in claim 11, wherein alteration of the command
set is automatically enabled by possession of an electronic license for
change in instrument capability as specified by the license.

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16. A system for altering a Standard Commands for Programmable
Instrumentation (SCPI) command set for instrument control,
comprising:

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means for selecting a node to alter, wherein each command of the
command set comprises a different combination of SCPI grammatical
elements, wherein the SCPI grammatical elements are organized
hierarchically in a tree data structure, and wherein the tree has nodes
with each node comprising one of the SCPI grammatical elements;

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means for specifying an alteration to the selected node;

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means for restricting access to the selected node and to any descendant
nodes of the selected node, wherein at least one node other than the
selected node is accessible for instrument control and wherein the
instrument is operable; and

when the grammatical element of the selected node is to be removed
from the command set,

means for removing the selected node and any descendant
nodes of the selected node from the tree;

otherwise, when a new node comprising a new grammatical element is
to be added to the command set

means for preparing the new node including the new
grammatical element for inclusion in the tree and

means for adding the new node to the tree; and

otherwise,

means for appropriately changing the grammatical element of
the selected node.

means for removing access restriction to the selected node and to any
descendant nodes of the selected node, wherein at least the restriction,
alteration, and removal steps are performed while the instrument is
operational.